

$$C_2 = r_{ci} \frac{dT_c}{dr} \Big|_{r_{ci}} = - \frac{q'}{2\pi k_c}$$

$$\text{assim: } r \frac{dT_c}{dr} = - \frac{q'}{2\pi k_c}$$

$$\frac{dT_c}{dr} = - \frac{q'}{2\pi r k_c}$$

$$T_c(r) = - \frac{q'}{2\pi k_c} \ln r + C_3$$

$$-k_c \frac{dT_c}{dr} \Big|_{r_{co}} = + \frac{q'}{2\pi r_{co}}$$

$$\frac{q'}{2\pi r_{co}} = h \left(- \frac{q'}{2\pi k_c} \ln r_{co} + C_3 - T_m \right)$$

$$C_3 = \frac{q'}{2\pi h r_{co}} + \frac{q'}{2\pi k_c} \ln r_{co} + T_m$$

$$\text{logo: } T_c(r) = \frac{q'}{2\pi k_c} \ln \frac{r_{co}}{r} + \frac{q'}{2\pi h r_{co}} + T_m$$

$$T_{ci} = \frac{q'}{2\pi r_{co} h} + \frac{q'}{2\pi k_c} \ln \frac{r_{co}}{r_{ci}} + T_m$$

$$T_{fo} = \frac{q'}{2\pi r_g h_g} + T_c$$

$$T_{fo} = \frac{q'}{2\pi r_g h_g} + \frac{q'}{2\pi h r_{co}} + \frac{q'}{2\pi k_c} \ln \frac{r_{co}}{r_{ci}} + T_m$$

$$\frac{dT_f}{dr} = - \frac{q'''}{2k_f} \Rightarrow T_f(r) = - \frac{q''' r^2}{4k_f} + C_4$$

$$\text{em } r = r_{fo} \text{ e } T = T_{fo} :$$

$$T_{fo} = - \frac{q''' r_{fo}^2}{4k_f} + C_4 \Rightarrow C_4 = T_{fo} + \frac{q''' r_{fo}^2}{4k_f}$$

$$C_4 = T_{fo} + \frac{q'}{4\pi k_f}$$